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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,200	10/02/2003	Akira Fukumoto	10873.1303US01	2135
7590 08/25/2005			EXAMINER	
HAMRE, SCHUMANN, MUELLER & LARSON, P.C. P.O. BOX 2902-0902 MINNEAPOLIS, MN 55402			LUU, CHUONG A	
			ART UNIT	PAPER NUMBER
			2818	
DATE MAILED: 08/25/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/678,200

Applicant(s)

FUKUMOTO, AKIRA

Examiner

Chuong A. Luu

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 August 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 8/15/2005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-18 have been considered but are moot in view of the new ground(s) of rejection.

PRIOR ART REJECTIONS

Statutory Basis

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The Rejections

Claims 1-2, 4-5, 9-11, 13 and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juengling (U.S. 6,627,549 B2) in view of Wang (U.S. 6,451,680 B1).

Juengling discloses a semiconductor device and method to form the same wherein the device comprises conductive film wirings or patterns (see Fig. 16). The conductive films form T-shaped grooves wherein the protrusions are formed at the corners of the conductive films forming the T-shaped grooves. (Fig. 12) Some of the conductive wirings are formed parallel to each other and comprise protrusions at the

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end thereof and protrusions that extend toward each other.(Figures 15 and 16). Also, Juengling discloses the formation of a dielectric material on and between the conductive film patterns and wirings (16).

Juengling teaches the above outlined features except for protrusions formed at the corners and end part of the wiring or patterns wherein the protrusions face a clearance between the wirings; the protrusions protrude outward from the corner and specifying the size of the protrusions. However, Wang discloses a method for reducing borderless contact leakage with protrusions formed at the corners and end part of the wiring or patterns wherein the protrusions face a clearance between the wirings; and the protrusions protrude outward from the corner (see Figure 6). Therefore, Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify and combine the Juengling 's device (in accordance with the teaching of Wang). While Juengling and Wang do not specify the size of the protrusion, it would be obvious to one with ordinary skill in the specific art to arrive at the claimed sizes, since a change in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237 (CCPA 1955). Doing so would facilitate the manufacture of the semiconductor and increase the speed of the semiconductor device.

Claims 3 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juengling (U.S. 6,627,549 B2) in view of Wang (U.S. 6,451,680 B1) and further in view of Hartranft et al. (U.S. Patent No. 5,846,874).

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Juengling and Wang teach everything above except for teaching that some protrusions bridge inward corner portions. Furthermore, Hadranft teaches that in an integrated circuit layout, the inner corners may be bridged with a protrusion (see column 1, lines 62-67. Figure 6). It would have been obvious to one with ordinary skill in the specific art to bridge a corner with a protrusion, since doing so would prevent shear stress damage to the chip.

Claims 6-8 rejected under 35 U.S.C. 103(a) as being unpatentable over Juengling (U.S. 6,627,549 B2) in view of Wang (U.S. 6,451,680 B1) and further in view of Jain et al. (U.S. 6,653,717 B2).

Juengling and Wang disclose the above outlined features except for teaching that there are provided bonding pads also coated with dielectric material wherein the bonding pads are formed with the same film that constitutes the conductive wirings and patterns. Furthermore, Jain teaches a semiconductor device with conductive wirings and patterns comprising some protrusions (see Figure 11) wherein the contact pads (58) are formed of the same film material as the wiring and pattern structures and wherein the contact pads are also covered with dielectric material. (see Figures 12 and 13). Thus, it would have been obvious to one with ordinary skill in the art to form contact pads and to form them with the same films, since Juengling, Wang and Jain teach how to form integrated circuit devices and contact pads are necessary structures for the integrated circuit devices to function.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Juengling (U.S. 6,627,549 B2) in view of Wang (U.S. 6,451,680 B1) and Jain et al. (U.S. 6,653,717 B2) and further in view of Wu et al. (U.S. Publication No. 2004/0056351 A1).

Juengling, Wang and Jain discloses everything except for bonding pads also coated with dielectric material wherein the contacts to the bonding pads are formed by patterning a photosensitive resin film on the insulating film and using the patterned photosensitive film as a mask to pattern the insulating film.

Jain et al. teaches a semiconductor device with conductive wirings and patterns comprising some protrusions (see Figure 11) wherein the contact pads (58) are formed of the same film material as the wiring and pattern structures and wherein the contact pads are also covered with dielectric material. (see Figures 12 and 13). Furthermore, Wu teaches the formation of a semiconductor device wherein patterns through a dielectric layer to form contacts are created by patterning a photosensitive resin film on the insulating film and using the patterned photosensitive film as a mask to pattern the insulating film ([0033]). Therefore, it would have been obvious to one with ordinary skill in the specific art to combine the teachings of Wu to those of Juengling, Wang and Jain, since Juengling, Wang and Jain teach how to form integrated circuit devices and contact pads are necessary structures for the integrated circuit devices to function, and since Wu accomplishes the formation of the contact by teaching that either a photosensitive resin mask or a photoresist mask may be used. ([0033]).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuong A. Luu whose telephone number is (571) 272-1902. The examiner can normally be reached on M-F (6:15-2:45).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Chuong Anh Luu
Patent Examiner
August 24, 2005